

Dr. Andrei P. Igoshev

Curriculum Vitae

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web-site: <http://www.pulsars.info/about.html>

Nationality: Russian

EDUCATION

Doctor of Philosophy in Astronomy, defended on 21st December 2017
Thesis title: “Neutron stars as fragmentary records of supernova explosions”
Radboud University Nijmegen | Nijmegen, the Netherlands
Department of Astrophysics
Research supervisor: Prof. Frank Verbunt

Specialist Diploma of Higher Education with Distinction in Astronomy, completed in July 2012
Diploma title: “Population synthesis of Galactic neutron stars: magnetic fields and luminosity models.”
Saint Petersburg State University | Saint Petersburg, Russia
Department of Astrophysics, Faculty of Mathematics and Mechanics
Research supervisors: Prof. Alexander F. Kholtynin, Prof. Sergei B. Popov

EMPLOYMENT

Research fellow, Department of Applied Mathematics, University of Leeds, UK
August 2019 - current, working with Prof. Rainer Hollerbach
MHD simulations of magneto-thermal evolution of neutron stars

Post-doctoral fellow, Technion - Israel Institute of Technology, Israel
December 2017 - July 2019, working with Prof. Hagai Perets
Study of binary and triple stellar evolution using the Gaia data, analysis of X-ray data, astrostatistics

PhD candidate, Department of Astrophysics/IMAPP, Radboud University, the Netherlands
October 2013 - October 2017
Study of observed properties of radio pulsars using the Bayesian and maximum likelihood analysis with C++ and Python.

Research engineer, laboratory of theoretical astrophysics, Saint Petersburg State University, Russia
January 2011 - September 2013
Development of the code for population synthesis of isolated radio pulsars using C++

HONORS and AWARDS

Rappe Promotie Premie, Institute for Mathematics, Astrophysics and Particle Physics, Radboud University Nijmegen
February 2018

NOVA PhD funding, Netherlands Research School for Astronomy (Nederlandse Onderzoekschool voor de Astronomie), October 2013 – September 2017

Best Diploma Thesis, Saint Petersburg State University
June 2012

Leonardo Euler Scholarship, Saint Petersburg State University
February 2008 - January 2009

COMMUNITY SERVICE

Journal Reviewer for MNRAS (2018 – current)
Member of the Dutch astronomical society (NAC)

RESEARCH EXPERIENCE

Scientific Interest

MHD, neutron stars, statistical methods in astronomy, magnetic fields, pulsars, magnetars, CCO, population synthesis method, initial parameters of neutron stars, binary stellar evolution, natal kicks

Research Expertise

MHD, statistical methods, X-ray observations, population synthesis, galactic dynamics, crust of NS, unsupervised machine learning, numerical methods

Proposals

Obs. ID 0804240201 “Revealing the nature of three pulsars with large spin down age in a vicinity of OB associations.”

PI: Igoshev, 60 ks at the XMM-Newton.

Obs. ID 15799 “Pushing the limits of COS: Working towards an optimized background correction.”

One of co-investigators, HST

INVITED SEMINARS

DAMTP, University of Cambridge

26 October 2020

Mullard Space Science Laboratory, University College London

29 October 2020

GRANTS

Travel grant, 2013, Saint Petersburg State University, 980 Euro

Travel grant, 2012, Saint Petersburg State University, 730 Euro

TEACHING EXPERIENCE

Student supervision, University of Leeds

Supervised master student Jingni Wang for her master project in data science

May 2020 - September 2020

Student supervision, Technion

Supervised master student Katya Makarenko during her internship in Technion

March 2019 - April 2019

Lab instructor, Technion

Bachelor level: “Physics Lab I”

March 2019 - June 2019

Teaching Assistant, Radboud Universiteit Nijmegen

Master level: “Cosmic magnetism”, “Binary stars”

September 2014 - June 2016

Bachelor level “Introduction to the General Relativity”, “Programming in Python”

September 2014 - June 2016

ORGANIZATION EXPERIENCE

Astro Hack Week 2019, 2020, member of organisational committee, Cambridge (UK) and Astro Hack Week 2020 in New York (USA), responsible for website, participant selection and facilitation

December 2018 - September 2020

Biweekly virtual international SeBa meetings, responsible for organisation
August 2020 - current

Fluid talks member of organisation committee. Monthly seminar/webinar in the University of Leeds.

March 2020 - current.

Member of LOC, Dutch Astronomical Conference, responsible for website, database, communication with participants and poster prize

September 2016 - May 2017

Journal club, Radboud Universiteit Nijmegen, responsible for organization

April 2016 - May 2017, biweekly meeting with master, PhD students and post-docs.

SKILLS

Languages

English - fluent, **Russian** - native, **German** - B1, **Dutch** - B2

Computing

Comfortable with Python, C++, C, Fortran, GSL, Gnuplot, Bash shell scripts, HTML, Linux, Latex

Familiar with ADQL, CSS, PHP, SQL, OpenMP, Javascript

PUBLICATIONS

Refereed

I have published 21 articles which earned more than 300 citations, h-index 10 according to NASA ADS.

First author

- A.P. Igoshev**, R. Hollerbach, T. Wood & K.N. Gourgouliatos “Strong toroidal magnetic fields required by quiescent X-ray emission of magnetars”, *Nature Astronomy*, accepted
- A.P. Igoshev** “The observed velocity distribution of young pulsars II. Analysis of complete PSR π ”, *MNRAS* 2020, 494, 3, 3663
- A.P. Igoshev**, H.B. Perets & E. Michaely “Inferred timescales for common envelope ejection using wide astrometric companions”, *MNRAS* 2020, 494, 1, 1448
- A.P. Igoshev** & H. Perets “Wide binary companions to massive stars and their use in constraining natal kicks” *MNRAS* 2019, 486, 3, 4098-4113
- A.P. Igoshev** “Ages of radio pulsar: long-term magnetic field evolution” *MNRAS* 2019, 482, 3, 3415-3425
- A.P. Igoshev**, S. Tsygankov, M. Rigoselli, S. Mereghetti, S. Popov, J. Elfritz, & A. Mushtukov “Discovery of X-rays from the old and faint pulsar J1154–6250” *ApJ* 2018, 865, 2, 116
- A.P. Igoshev**, & S.B. Popov “How to make a mature accreting magnetar” *MNRAS* 2018, 473, 3, 3204-3210
- A.P. Igoshev**, J.G. Elfritz, S.B. Popov “Post fall-back evolution of multipolar magnetic fields and radio pulsar activation” *MNRAS* 2016, 462, 4, 3689
- A.P. Igoshev**, F. Verbunt, E. Cator “Distance and luminosity probability distributions derived from parallax and flux with their measurement errors. With application to the millisecond pulsar PSR J0218+4232” *A&A* 2016, 591, 10
- A.P. Igoshev** & S.B. Popov “Magnetic field decay in normal radio pulsars” *AN* 2015, 336, 8-9, 831
- A.P. Igoshev** & S.B. Popov “Modified pulsar current analysis: probing magnetic field evolution” *MNRAS* 2014, 444, 1066
- A.P. Igoshev** & S.B. Popov “Gaussian mixture model and population synthesis of radio pulsars” *MNRAS* 2013, 434, 2229
- A.P. Igoshev** & S.B. Popov “Neutron star’s initial spin period distribution” *MNRAS* 2013, 432, 967
- A.P. Igoshev**, S.B. Popov & R. Turolla “Unifying neutron stars: getting to GUNS” *AN* 2014, 335, 3, 262
- A.P. Igoshev** & A.F. Kholtygin “Statistics of magnetic fields and fluxes of massive OB stars and the origin of neutron star magnetic fields” *AN* 2011, 332, 1012

Other

- K. Gourgouliatos, R. Hollerbach & **A.P. Igoshev** “Powering Central Compact Objects with a Tangled Crustal Magnetic Field”, *MNRAS* 2020, 495, 2, 1692
- M. Rozner, E. Grishin, Y.B. Ginat, **A.P. Igoshev** & V. Desjacques “Axion resonances in binary pulsar systems”, *JCAP* 2020, 3, 061
- S. Toonen, H.B. Perets, **A.P. Igoshev**, E. Michaely & Y. Zenati “The demographics of neutron star - white dwarf mergers: rates, delay-time distributions and progenitors” *A&A* 2018, 619, 13
- F. Verbunt, **A.P. Igoshev**, E. Cator “The observed velocity distribution of young pulsars” *A&A* 2017, 608, 15
- S. Repetto, **A.P. Igoshev**, G. Nelemans “The Galactic distribution of X-ray binaries and its implications for compact object formation and natal kicks” *MNRAS* 2017, 467, 1, 298-310
- D.J. Jones, **A.P. Igoshev**, M. Haverkorn “A new method to probe the thermal electron content of the Galaxy through spectral analysis of background sources” *MNRAS* 2016, 460, 3, 3298-3304

Non-refereed

- A.P. Igoshev** & S.B. Popov “Is PSR J0250+5854 at the Hall attractor stage?”, 2018, RNAAS, 2, 3, 171
- S.B. Popov, **A.P. Igoshev**, R.Taverna & R. Turolla “Looking for Hall attractor in astrophysical sources”, 2017, JPhCS, 932, 1
- A.P. Igoshev** & A.F. Kholtygin “Population synthesis of young neutron stars” Proceedings of the International Astronomical Union, 2013, 291, 411
- A.F. Kholtygin, S.N. Fabrika, N.A. Drake & **A.P. Igoshev** “Magnetic fluxes of massive stars: statistics and evolution” Active OB stars: structure, evolution, mass loss, and critical limits, Proceedings of the International Astronomical Union, IAU Symposium, 2011, 272, 198

PRESENTATIONS

Talks

- “Timescale of common envelope ejection” EAS 2020: symposium Common-envelope systems: progenitors, mergers and survivors, 3 July 2020
- “New constraints on physics of NSs from parallaxes and proper motions” PHAROS conference 2019, the multi-messenger physics and astrophysics of neutron stars, Barcelona, Spain, 22 April 2019
- “Multipoles re-emergence and central compact objects” Physics retreat, Ein Afek, Israel, 21 February 2018
- “Multipoles re-emergence and central compact objects” Physics of neutron stars, Saint Petersburg, Russia, 12 July 2017
- “Radio Pulsar Activation seen through a Prism of High Order Multipoles Magnetic Field Evolution” Formation and evolution of neutron stars, Bonn, Germany, 14 November 2016
- “Probability Distributions for Pulsar Distance and Luminosity” Different Flavors of MSPs and their Connections, Bonn, Germany, 30 November 2015
- “From parallax to distance: not easy” NW3 meeting, Utrecht, Netherlands, 5 November 2015
- “Comprehensive analysis of pulsars velocity distribution” International conference Physics of neutron stars, St. Petersburg, Russia, 28 July 2014
- “Analysis of magnetic field decay in pulsars” High energy astrophysics – today and tomorrow, Russian Space Research Institute RAS, 25 December 2013
- “Magnetic fields decay in pulsars. Population synthesis and other statistical methods” XMM-Newton 2013 Science Workshop, ESA, Madrid, Spain, 23 May 2013
- “Analysis of magnetic field decay in pulsars. Accurate calculations and details” High energy astrophysics – today and tomorrow, Russian Space Research Institute RAS, 26 December 2012
- “Spin Down Age: the key to magnetic field decay” Electromagnetic Radiation from Pulsars and Magnetars, in University of Zelona Gora, Poland, 26 April 2012

Posters

“On the Velocities that BH- and NS-XRBs Receive at Formation: Bayesian Approach”

Binary stars, Institute of Astronomy, Cambridge, UK, 24-30 July 2016

“Natura evanesca/elusive nature: high order multipole structure of magnetic field survives the fall back episode”

71 Nederlands Astronomy Conference, Nunspeet, the Netherlands, 23-25 May 2016

“Initial periods of radio pulsars and magnetic field decay”

All Russian Astronomical Conference (VAK), Pulkovo Observatory, Saint Petersburg, 25 September 2013

Latest results from the neutron-star laboratory, Amsterdam, The Netherlands, May 6 2013